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August 4, 2006

Via Messenger

File: 13137.0209

Gordon T. Arnold, Esq.
Arnold & Ferrera, LLP
2401 Fountain View, Suite 630
Houston, Texas 77057

Re: **Reexamination Control Nos. 90/007,349 and 90/007,585**
**Merged Reexamination of U.S. Patent No. 6,401,824**

Dear Gordon:

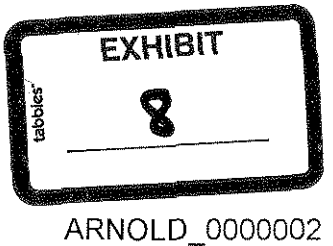
This will acknowledge, with thanks, receipt of materials received from and sent to the United States Patent and Trademark Office ("USPTO") on July 14, 2006 and July 24, 2006, respectively, in the above-captioned merged reexamination proceeding. The materials we received include a summary of the personal interview with the USPTO reexamination examiner on July 11, 2006, and a response to the office action mailed May 22, 2006.

In reviewing your arguments relating to the patentability of the pending claims over the prior art relied on by the USPTO examiner, as supported by the Affidavit of Gary R. Wooley, we have noted certain information that we consider to be material to the patentability of those claims that refutes or at least is inconsistent with positions that you and Dr. Wooley have taken in opposing the positions of unpatentability relied on by the USPTO. Specifically, we are of the opinion that the arguments that you and Dr. Wooley have submitted to the USPTO regarding distinctions between "surge pressure" and "circulation pressure" are misleading.

Specifically, you rely on Figure 1 of U.S. Patent No. 6,401,824 ("the '824 patent") as demonstrating the patented device and characterize the patented device as reducing "surge pressure" when compared to prior art devices. In support of your argument, you refer the examiner to Figure 8(A) of the Head *et al.* prior art reference, which you characterize as addressing something "completely different, that is 'circulation pressure'." This argument is both inaccurate and misleading. The term "surge pressure" does not appear in any of the claims, original or amended.[1] Furthermore, the '824 patent specification is silent as to any objective measurements of surge pressure. Therefore, there is no support in the specification or claims of the '824 for your argument that "surge pressure" reductions distinguish the claimed invention from that disclosed by the prior art.

[1] Amended claim 11 includes the phrase "relief of excess pressure to the well bore caused during lowering of the tubular string" but no objective criteria for judging what "relief" is caused by the claimed combination.





As you are likely aware, and as Dr. Wooley is certainly aware, all devices that are inserted into a well bore through a fluid column will create a "surge pressure." That is true of both the device of Figure 1 of the '824 patent, and of Figure 8(A) of the Head *et al.* reference. The surge pressure created by the insertion of either device through a fluid column in a well bore is primarily dependent on the portion of the apparatus presenting the smallest constriction, not on the portion of the apparatus presenting the largest opening.

At page 16 of your arguments regarding patentability submitted to the USPTO, you state that a person of ordinary skill "would understand that it is the relative openings of the outer tubular and the inner tubular that causes the purpose (surge pressure relief) to be accomplished." This statement is also found on pages 2 and 3 of Dr. Wooley's Affidavit. In support of your statement, you direct the USPTO examiner to the bottom of Figure 1 of the '824 patent, which you label "substantially unrestricted lower open end," and to a central section of Figure 8(A) of the Head *et al.* reference, which you label "restricted lower end." From this comparison you extrapolate the conclusion that surge pressure will be reduced by the configuration of Figure 1, but will not be reduced by the configuration of Figure 8(A). Your arguments are false and misleading.

As stated above, the surge pressure of any device that is lowered into the well bore will be controlled, at least in part, by the smallest constriction in the apparatus. In the Figure 1 of the '824 patent, the Figure that you have selected to provide to the USPTO for purposes of comparison, this constriction is shown by the number 35, which is an opening that is substantially smaller than the "substantially unrestricted lower open end" of the float shoe that you have labeled in the drawing. In order to assist you in providing a fair representation of the prior art to the USPTO we have prepared a printout of relative surge pressures using well-recognized surge modeling software, "SurgeMod." This software is not proprietary to Weatherford and is commercially available. The results of this comparison are appended in the attached Declaration of James Martens. As you can see, based on the computer modeling, the surge pressure of the Figure 1 ('824 patent) device and the surge pressure of the Figure 8(A) (Head *et al.*) device are virtually identical.

In addition to the false arguments outlined above, Dr. Wooley in his affidavit acknowledges at page 6 that "although high surge and swabbing pressures" are mentioned in the SPE paper abstract, they are not addressed further in the paper. While Dr. Wooley is correct in his statement that high surge and swabbing pressures are mentioned as a problem in the Abstract of the Head *et al.* reference, he fails to acknowledge that there are other references to the same surge and swabbing system in the remaining text of the prior art reference. In particular, in identifying the "main technical challenges" that the Head *et al.* reference addresses, the second technical challenge is "to prevent the open hole being exposed to excessive pressures during liner installation and while cementing." As Dr. Wooley is surely aware – this is swab and surge pressure.

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A person of ordinary skill in the art, the same fictional person repeatedly referred to by Dr. Wooley in his affidavit, would be well aware of the fact that all cementing equipment, including float shoes, must be inserted into the well bore through a fluid column to the point of application. Therefore, for Dr. Wooley to suggest that the device of Figure 8(A) of the Head *et al.* reference does not disclose a surge pressure reduction system is certainly a misrepresentation of the true nature of the reference's teaching. The device of Figure 8(A) of the referenced paper is a wash shoe for use inside a casing. As such, it must be lowered into well bore through fluid. Inherently the process of inserting the device into the well will create a surge pressure. As detailed in the attached Declaration of Mr. Martens, the surge pressures of the prior art device and the surge pressures of the apparatus under reexamination are virtually identical.

We trust that you will provide this information, which we consider to be material to the patentability of the pending claims and not cumulative to any other information already of record, to the USPTO prior to the issuance of any further action by the USPTO or prior to any interviews regarding the patentability of these claims.

Very truly yours,

Stephen H. Cagle

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# DECLARATION OF JAMES G. MARTENS

I, James G. Martens, declare as follows:

1. My name is James G. Martens. I am over 21 years of age and I am competent to give the testimony set forth below based on my personal knowledge of the circumstances giving rise to this declaration.

2. I have been employed by Weatherford International, Inc. since 1988. I am currently Product Line Vice President of Cementing Products, and have held that position since 2000.

3. I have reviewed the July 24, 2006 "Response to Office Action mailed May 22, 2006" and the Affidavit of Gary R. Wooley dated July 21, 2006 appended thereto, both of which were filed in the merged reexamination proceeding of United States Patent No. 6,401,824 ("the '824 patent"). I have also reviewed SPE/IADC Paper 52795 entitled "Slimwells Without the Pain," authored by P. Head *et al.* (the "Head *et al.* reference"), which I understand has been relied on by the United States Patent and Trademark Office during the reexamination of the claims of the '824 patent. In my opinion, the arguments submitted on behalf of Davis-Lynch to the Patent and Trademark Office regarding the distinctions between the claimed apparatus of Figure 1 of the '824 patent and Figure 8(A) of the Head *et al.* reference are false and misleading.

4. The picture included on page 6 of the Affidavit of Gary R. Wooley characterizes the tool depicted by Figure 8(A) of the Head *et al.* reference as having a "restricted lower end." Dr. Wooley illustrates the difference between "restricted" and "unrestricted" by a line which encompasses the complete outside diameter of the Head *et al.* device. This is not a fair representation or characterization. The restriction in all of these types of tools is necessarily the inside diameter of the inner tube before conversion, and the outside diameter of the inner tube after conversion.

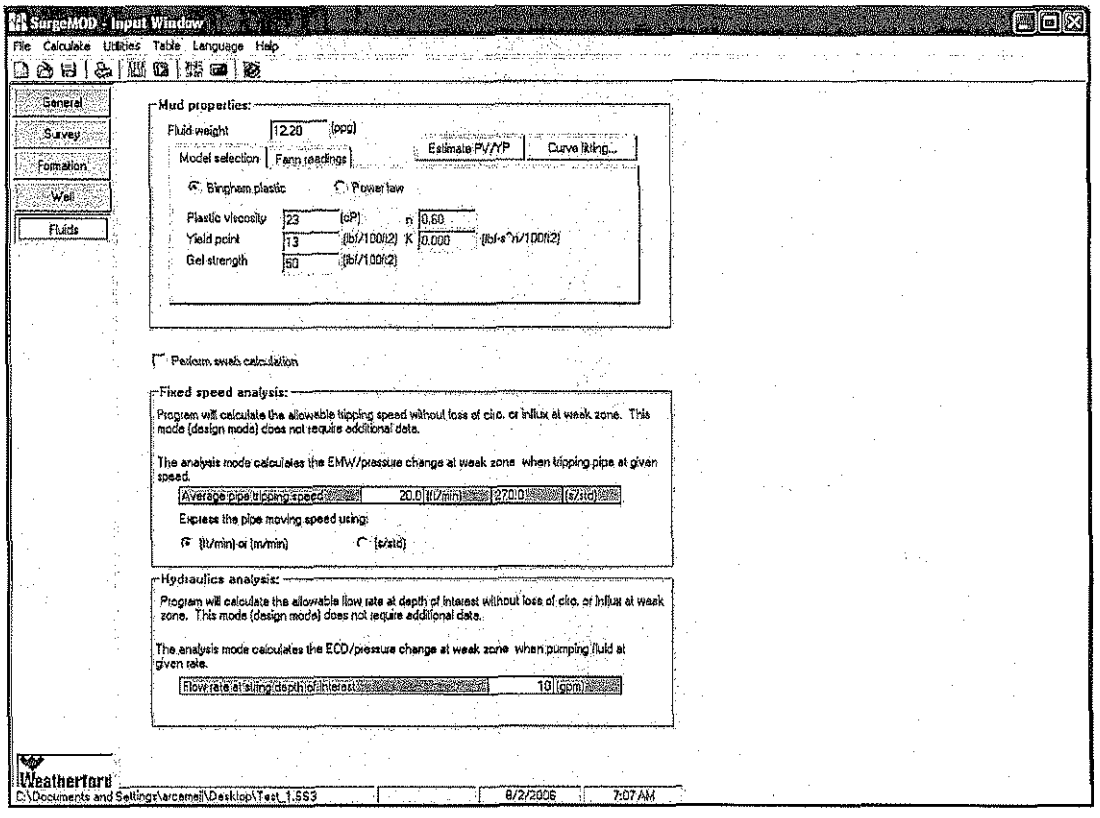
5. In characterizing the device shown by Figure 1 of the '824 patent, Dr. Wooley at page 5 states that the lower end of the tool is "substantially unrestricted." In my opinion, there are two manners to interpret "substantially unrestricted" lower end:

> (1) That the opening beneath the inner tubular opens up to the outer tubular's inside diameter. This would be indeed be considered "substantially unrestricted." It has been common in the oilfield for pipe to be run open-end for more than forty years. This is not a new concept.
>
> (2) That there is an opening beneath the inner tubular of a size greater than the restriction in the inner tubular, but less then the pipe's inside diameter. The wording of the '824 patent claims makes this indefinite and subjective. To remove the subjectivity, I have applied well known calculations to quantify what change would be made to the flow pressures in a conservative model.

6. On the issue of substantially unrestricted flow, I looked at this from a physics and engineering perspective. Two methods were used to determine the impact of restriction on fluid flow. A simple orifice calculation was made that showed an approximately 2-psi pressure

differential between a 2-inch bore as illustrated by Head *et al.*, and large bore (5-inch) equipment. Weatherford's standard offering is 3.6 inches. The pressure differential from 5-inch to full opening was insignificant.

7. A well-recognized surge modeling software, SurgeMod, produced by a third party, was used to make the determination of what would be the impact of an opening larger then that as shown in the prior art. Weatherford's contention is that the prior art already teaches a substantially unrestricted lower open end leading to said well bore to permit substantially unrestricted flow. The pressure drop due to the orifice diameter within the float shoe was calculated using the following assumptions (See Figure 1 below):




The mud characteristics were based on a mud which is specified by API for the testing of float equipment. The mud properties will be different for every application, but should not substantially change the results.

8. Three sizes of openings to the well bore were modeled. A 2-inch bore as shown in the Head *et al.* drawing, a 3.6-inch bore which is standard for Weatherford float equipment, and a 5-inch bore which is standard for Weatherford's large opening equipment. Although no dimensions are provided for any of the components of the claimed combination in the '824 patent, the 3.6-inch bore that is used by Weatherford is a size that is commonly used in the drilling tool industry. Therefore, for purposes of the computer modeling I have assumed that the opening in the component of the claimed combination identified by the numeral 35 in the '824 patent is approximately 3.6 inches. To model, a very benign and conservative set of criteria were considered. The assumptions are listed below. A test wellbore and work-string schematic were

designed in SurgeMOD to evaluate the pressure fluctuations due to various orifice diameters (See Figure 2).

| | |
|---|---|
| Wellbore: | |
| 13-3/8" cased hole to 1020ft | ID = 12.415" |
| 14" open hole to 2082ft | |
| | |
| Work string: | |
| 1000ft 5-1/2" drill pipe | TJID = 4.000" ID = 4.670" |
| 1000ft 11-3/4" liner | ID = 10.772" |
| Float Collar | ID = 3.750" and 3.125" |
| 80ft 11-3/4" liner shoe track | ID = 10.772" |
| Float Shoe | ID = 2.000" |
| | ID = 3.600" |
| | ID = 5.000" |

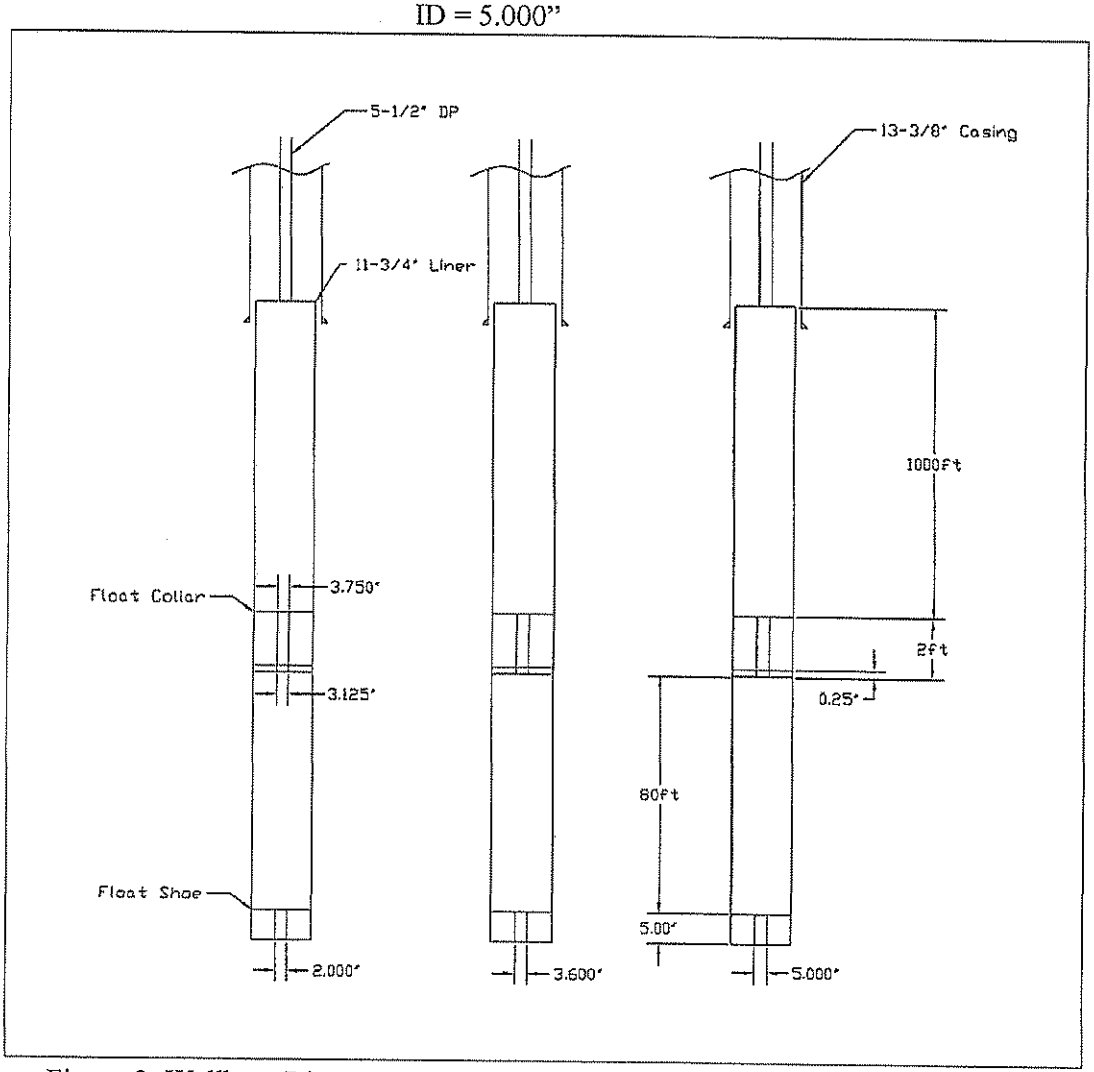



Figure 2: Wellbore Diagram.

The pressure drop was calculated across the variable orifice diameter within the float shoe. All other parameters remained fixed.

9. First, the pressure drop was calculated using a float shoe with a 2.000-inch orifice diameter. Figure 3 shows the wellbore and work string schematic within SurgeMOD.

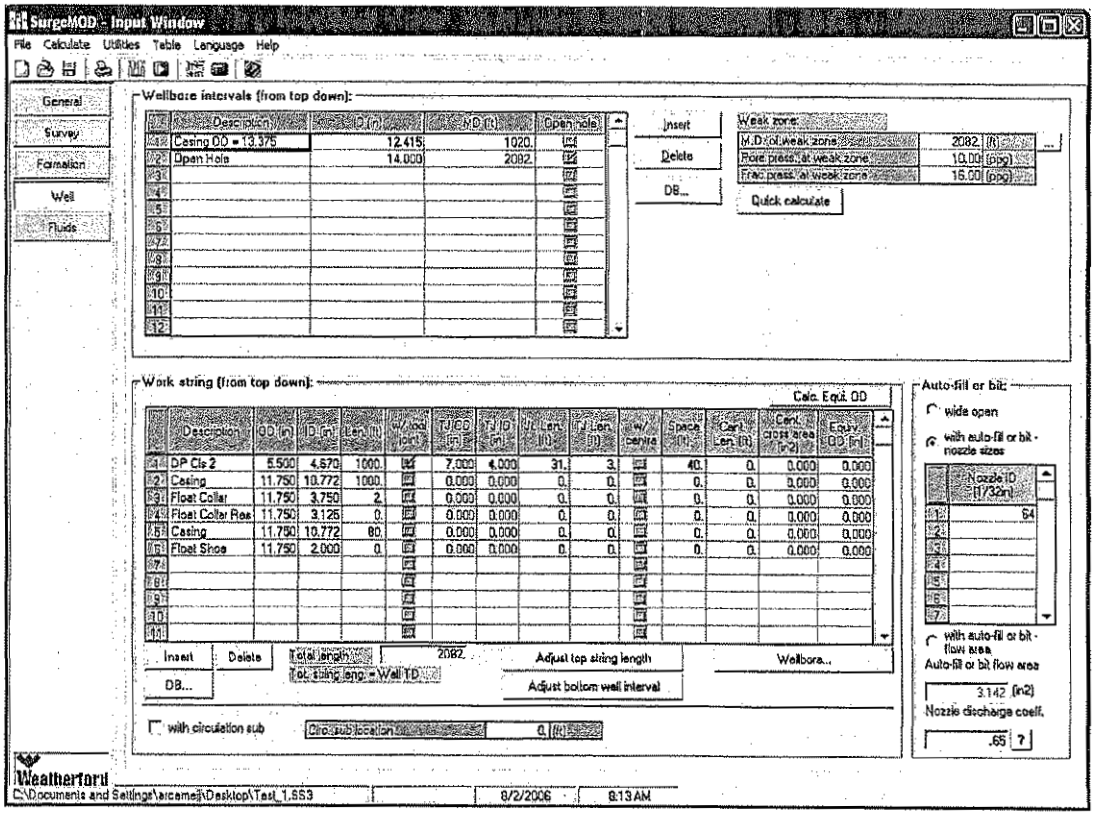



Figure 3: SurgeMOD Schematic With 2.000-inch Orifice Float Shoe.

When this program was executed, the auto-fill pressures ranged from 1327 to 1334 psi.

10. The pressure drop was then calculated using a float shoe with a 3.600-inch orifice diameter. Figure 4 shows the wellbore and work string schematic within SurgeMOD.

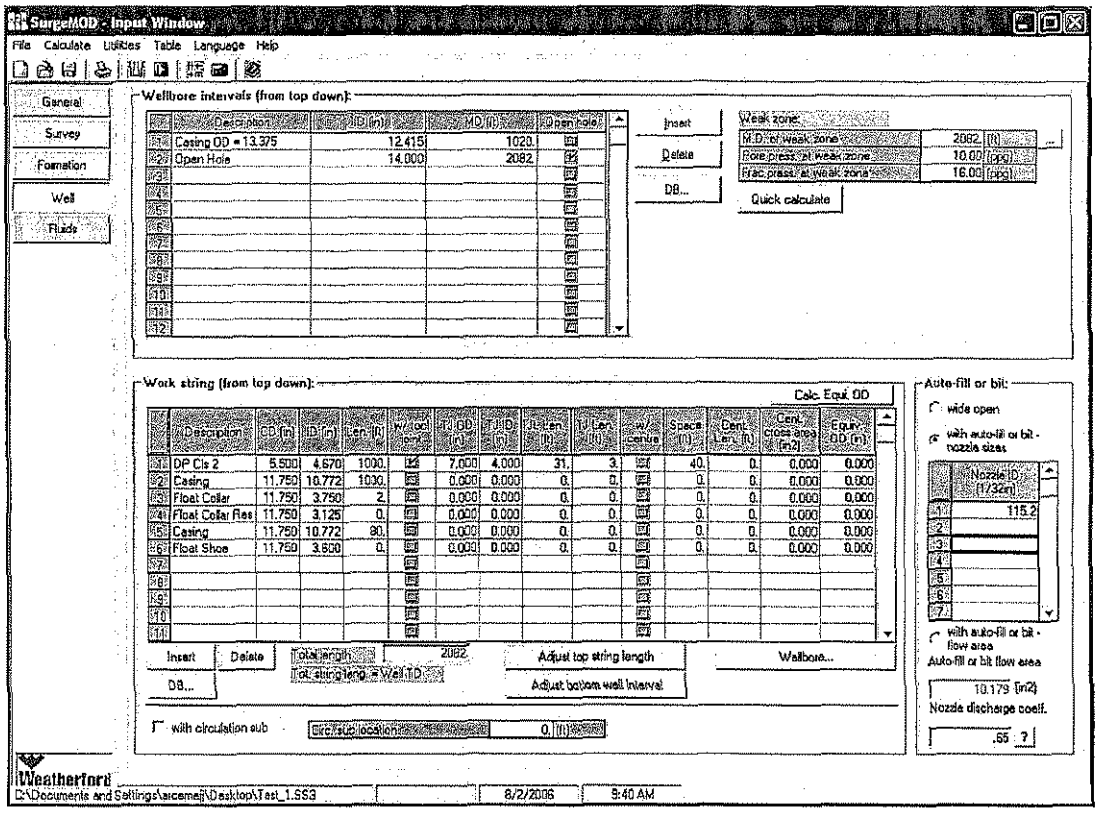



Figure 4: Surgemod Schematic With 3.600-inch Orifice Float Shoe.

When this program was executed, the auto-fill pressures ranged from 1322 to 1329 psi.

11. The pressure drop was also calculated using a float shoe with a 5.000-inch orifice diameter. Figure 5 shows the wellbore and work string schematic within SurgeMOD.

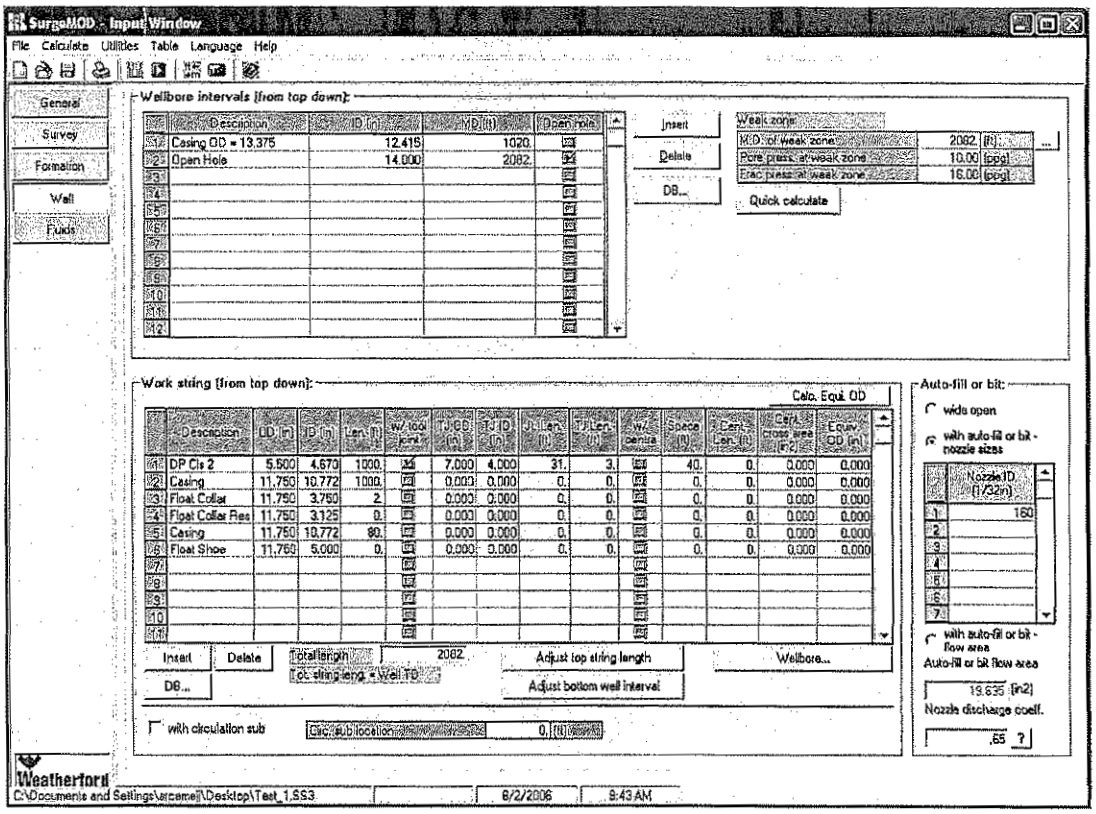



Figure 5: Surgemod Schematic With 5.000-inch Orifice Float Shoe.

When this program was executed, the auto-fill pressures ranged from 1321 to 1329psi.

12. The results from the three test configurations show an insignificant variance when running the liner at a rate of 20 ft/min. The comparative charts can be seen in Figure 6.

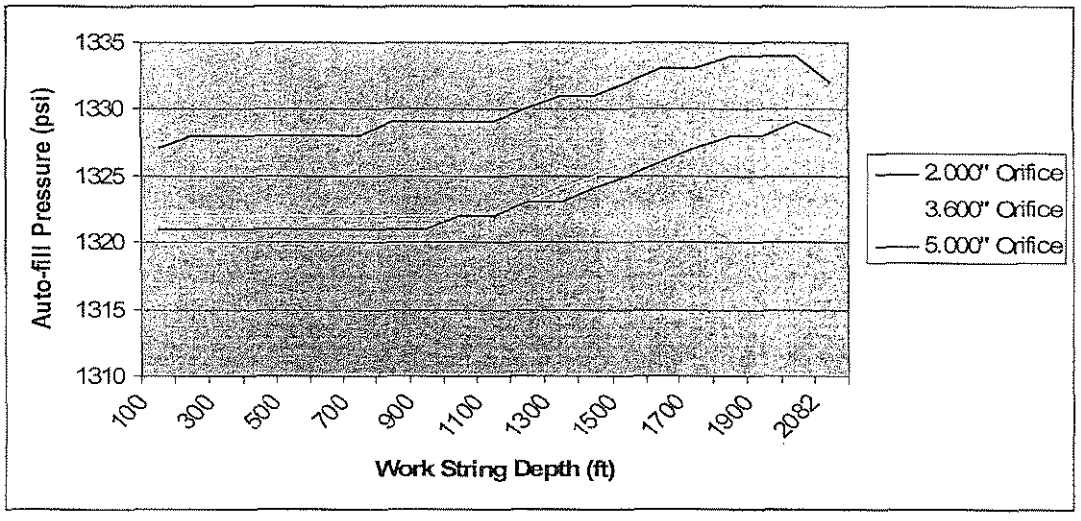



Figure 6: Pressure Comparison When Running Work String To TD.

From these results and based on my experience in the field I have concluded that there was at maximum a 7 psi or a 0.5% pressure differential when calculated using a set of criteria most likely to highlight the impact of the size change. With this data one would easily conclude that the common equipment and even the 2inch bore in the Head *et al.* diagram would be considered just as "substantially unrestricted" as the flow through the claimed apparatus of Figure 1 of the the '824 patent.

13. I declare under penalty of perjury that the foregoing is true and correct.

Executed the 4 day of August, 2006.

James G. Martens

James G. Martens